

### REMARKS

Claims 1-10, 13-16, and 18 are currently pending. Claims 1, 2, and 15 have been amended, the amendment of which is supported by Applicant's original disclosure, such as page 3, lines 7-19. It is respectfully submitted that no new matter has been added.

#### **Claim Rejections under 35 U.S.C. 112, first paragraph**

The Patent Office rejected claims 1-10, 13-16, and 18 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement because claims 1, 2, and 15 recite a "hard handover in a non-cellular system" and the Patent Office has alleged that there is no mention of a "hard handover in a non-cellular system" in description.

Paragraph 0018 of Applicant's disclosure provides as follow:

The maximum likelihood optimum algorithm of the present invention can be suitably used for a low-cost, low-power, and short-distance network such as Bluetooth. However, the present invention is not limited to that. The present invention is applicable also to a cellular system network or a PHS system network.

Here, it is obvious for a person skilled in the art that the "short-distance network such as Bluetooth" is a non-cellular system. Therefore, it is supported by the description in the specification that the present invention is applicable to a non-cellular system. While the present invention is applicable to a non-cellular system, the specification mentions that the present invention is applicable also to a cellular system.

The following is a description of a soft handover and a hard handover. "Soft handovers" are used only in a cellular system and never used in a non-cellular system, which is clear for a person skilled in the art. Thus, handover in a non-cellular system is always a hard handover. As explained above, a "hard handover in a non-cellular system" is supported in the specification.

Accordingly, Applicant requests that the Patent Office withdraw its rejection of claims 1-10, 13-16, and 18 under 35 U.S.C. 112, first paragraph.

#### **Claim Rejections under 35 U.S.C. 102(b)**

The Patent Office rejected claims 1-6 and 16 under 35 U.S.C. 102(b) as being anticipated by Chheda, U.S. Patent No. 5,946,621.

A claim is anticipated when each and every non-inherent claim limitation is disclosed, in

general, by a single reference. (See MPEP 2131)

The claimed invention and Chheda et al. (US Patent 5,946,621) provide totally different solutions for totally different problems.

Applicant's invention relates to hard handover in a non-cellular system, while Chheda relates to soft handover and its solution uses specific terminal and cell specific tables called "active set", "candidate set", and "neighbor set" (cell specific). Those teachings are not applicable to hard handovers in non cellular systems.

In the node selecting method according to the Applicant's invention, the number of nodes present within each overlapping region between a communication zone of the mobile node and communication zones of each of the specified nodes is counted. The nodes are arranged uniformly dispersedly and regardless of the strength of signals. On the other hand, Chheda discloses that the neighbor set comprises the pilots that could be received with sufficient strength to enable successful communication (column 2, lines 58-59). This means that the neighbor sets depend on the strength of the pilot signals.

In the office action, the examiner points out that "it is noted that one of ordinary skill in the art, would read applicant's 'candidate node' as a candidate node within a 'candidate set.' Therefore, the claimed invention appears to be a soft handover."

This indication is completely wrong. If, hypothetically, a handover is performed from node A to node B, node B corresponds to the "candidate/target node" in the decision about whether or not the handover is performed.

The term "candidate" is not a specific terminology for "soft handovers". As is described on page 2, lines 6-26, of Applicant's disclosure, "handover" means selecting a node and switching connection to the node. It obviously is a hard handover. There is mentioned on page 2, lines 15-16, of Applicant's disclosure, the ping-pong effect. However, such a problem does not occur in soft handovers. Therefore, it is clear that the present invention relates to a hard handover in a non-cellular system.

Thus, Chheda does not anticipate claims 1-10, 13-16, and 18.

#### **Claim Rejections under 35 U.S.C. 103(a)**

The Patent Office rejected claims 7 and 8 under 35 U.S.C. 103(a) as being unpatentable over Chheda, in view of Rohani, U.S. Patent No. 6,195,342.

According to an embodiment of the Applicant's invention, there are no base stations, and each of the mobile nodes communicates with each other nodes directly without employing a base station or a base node, so that there is one type of node only, that is, a mobile node. An aspect of an embodiment of Applicant's invention is that the number of nodes present within each overlapping region is counted without using a received signal strength indicator.

In the office action, the examiner points out that "Chheda does disclose 'selecting, as a candidate node for next communication with the mobile node the specified node in the communication zone of which the largest number of nodes have been counted.'

Chheda teaches only about optimizing "neighbor sets".

In col.3, lines 49-55, of Chheda, different sets of nodes in CDMA (active set, candidate set, neighbor set and remaining set) are described.

In addition, Chheda describes the "candidate set" as follows:

"The candidate set comprises pilots that are not currently in the active set, but that have been received by the mobile unit at a strength sufficient to indicate successful communication".

As is clear from this description, Chheda performs the selection of a candidate node for next communication based on the strength of the pilots, and not based on "the largest number of nodes have been counted" as in the present invention.

Moreover, Chheda describes that the neighbor set is updated by the BSC, and the updated neighbor set is sent to the mobile unit (see col.3, lines 15-21).

The present invention differs from Chheda in that all such operations are performed at the mobile unit in the present invention.

Given the difference of hard and soft handover between the claimed invention and Chheda, as discussed above, Chheda, as a base reference, cannot make claims 7 or 8 obvious.

Furthermore, the section of Rohani, column 5, lines 34-46, cited by the Patent Office refers to discloses a frequency that the Extended Hand-Off Message is transmitted by the cell is determined by the traveling speed of the mobile station. Claim 7 depends from claim 5 which recites that the mobile station performs specifying, counting and selecting neighbour nodes at predetermined periods. Rohani, in contrast, provides a teaching for transmitting a message from the cell at a frequency in accordance with the speed of the mobile station and not for specifying, counting, and selecting neighbour nodes by the mobile station.

Thus, the combination of Chheda in view of Rohani does not make obvious claim 7 for this additional reason.

The Patent Office rejected claims 9, 10, and 18 as being unpatentable over Chheda, in view of Haas, U.S. Patent No. 6,304,556.

The Patent Office asserted that Chheda does not disclose the specified nodes are mobile nodes and that Haas in column 4, lines 47-56 remedies this deficiency.

Haas in column 4, lines 47-56, discloses as follows:

The present invention overcomes the drawbacks of previous network protocols through provision of two new protocols, one for routing and one for mobility management, both of which are particularly well-suited for use within ad-hoc networks. The routing protocol is a proactive-reactive hybrid routing protocol-called the Zone Routing Protocol (ZRP)- that allows efficient and fast route discovery in the ad-hoc network communication environment (i.e., large geographical network size, large number of nodes, fast nodal movement, and frequent topological changes).

Haas does disclose finding a route from a source node to a destination node as illustrated in Figure 4. Haas in column 8, line 37, through column 9, line 18, discloses two methods: a cluster head method and a method of distributed mobility management. In the cluster head method, routing occurs from the source node to its cluster head to the destination cluster head to the destination node. In the distributed mobility management scheme, certain nodes in the network assume the mobility management function. This is quite different from Applicant's claimed invention in which numbers of nodes in the communication zones of the mobile node and its neighbor nodes are counted to determine a next node for communication.

Accordingly, claims 9, 10, and 18 are allowable over Chheda in view of Haas for this reason and also because they depend from allowable base claims.

The Patent Office rejected claims 13 and 14 as being unpatentable over Chheda in view of Agrawala, U.S. Published Patent Application No. 2005/0020275.

The Patent Office asserted that Chheda does not teach the specified nodes are uniformly dispersedly arranged and that Agrawala is alleged to teach this difference in paragraph 0031.

Agrawala, in paragraph 0031, discloses as follows:

FIG. 1 illustrates an embodiment of a wireless multinodal

communications system 100 of the present invention. System 100 includes a widely distributed network of wireless communications nodes 102a-102n (collectively referred to herein as "communications nodes 102"). As discussed above, system 100 can be implemented in a variety of mobile and/or non-mobile wireless networks, including sensor-based applications. Additionally, communications nodes 102 are positioned in three-dimensional space.

Agrawala discloses nodes transmitting and receiving measurement messages which are exchanged with other nodes. Agrawala does not disclose numbers of nodes in the communication zones of the mobile node and its neighbor nodes are counted to determine a next node for communication.

Accordingly, claims 13 and 14 are allowable over Chheda in view of Agrawala for this reason and also because they depend from an allowable base claim.

#### **Response to Arguments**

Applicant wishes to point out that the arguments on page 4, lines 17-22, of the Final Office Action dated April 17, 2009, are directed to a secondary reference, Gross, that is no longer cited by the Patent Office in rejecting any of the claims.

As to the Patent Office's arguments, on page 5, lines 1-5, of the Final Office Action dated April 17, 2009, in the distributed mobility management scheme of Haas, certain nodes in the network assume the mobility management function. This is quite different from Applicant's claimed invention in which numbers of nodes in the communication zones of the mobile node and its neighbor nodes are counted to determine a next node for communication.

Paragraph 0031 of Agrawala does not teach or suggest specified nodes are uniformly dispersedly arranged. Figure 1 is not an unambiguous showing of nodes uniformly dispersedly arranged. If Figure 1 may be considered a teaching of a node distribution, it is still not a teaching for **specified nodes** that are uniformly dispersedly arranged.

It is respectfully submitted that the rejections of claims 1-10, 13-16, and 18 under 35 U.S.C. 112, first paragraph, under 35 U.S.C. 102(b) based on Chheda, and under 35 U.S.C. 103(a) based on Chheda in combination with Rohani, Haas, and/or Agrawala, have been overcome, and it is respectfully requested that the Patent Office reconsider and remove the rejections of these claims. The Patent Office is respectfully requested to favorable consider and

Serial No.: 10/500,404  
Art Unit: 2617

allow all of the pending claims 1-10, 13-16, and 18 as now presented for examination. An early notification of the allowability of claims 1-10, 13-16, and 18 is earnestly solicited.

Serial No.: 10/500,404  
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